Ontario Ministry of Health

Report by Interministerial Committee on the Recommendations by The Coroner's Jury Regarding the July 14, 1980 Fire at the Extendicare Nursing Home Mississauga

Ontario

Ministry
of
Health

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June 11, 1982

MEMORANDUM TO: Mr. G. W. S. Scott, Q.C.
Deputy Minister of Health
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FROM: A. van den Kerkhof
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RE: INTERMINISTERIAL COMMITTEE TO REVIEW JURY RECOMMENDATIONS ON THE EXTENDICARE MISSISSAUGA NURSING HOME FIRE

Please find enclosed the comments prepared by the Interministerial Committee assigned to review the jury's recommendations made as a result of the inquest into the fire at the Extendicare Nursing Home, Mississauga, on July 14, 1980.

Because of the major loss of life it is only natural that this fire evoked a considerable amount of emotional reaction. While this reaction is entirely understandable, it should be recognized that fire incidents, particularly those caused by smoking, do occur fairly frequently but are generally contained or limited to property damage.

The reasons why this fire went out of control and exacted such a tragic toll are many and are reflected in the jury's numerous recommendations, notably those dealing with training and communications.

While commending the jury for having done a very conscientious job we had to observe on occasion that some of its recommendations are impracticable. This was undoubtedly caused by the condition of a lay jury having to address complicated technical issues without continuous access to the counselling of an experienced unbiased expert, say a senior engineer from the Ontario Fire Marshal's office, or a specialist consultant in private practice. A precedent for such an approach is the Coroner's Advisory Committee dealing with anaesthetic mishaps. We recommend that the Coroner's Office consider availing itself of such expertise during future inquests of similar complexity.

AvdK/pd

INTERMINISTERIAL COMMITTEE TO REVIEW

THE JURY RECOMMENDATIONS ON THE

EXTENDICARE MISSISSAUGA NURSING HOME FIRE

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CONTENTS

1. Summary

2. Format of the Report

3. Review of Jury's Recommendations

4. Appendices

SUMMARY

On July 14, 1980 a fire occurred in the Extendicare Nursing Home in Mississauga resulting in the death of 25 residents of the home. An inquest under the Coroner's Act was initiated on September 15, 1980 and completed on October 30, 1980. Witnesses called to testify at the inquest included:

- Ontario Provincial Police
- Physicians
- Staff and Administration of Extendicare Nursing Home
- Mississauga Fire Department
- Peel Regional Police
- Ministry of Health
- Ontario Fire Marshal's Office
- Experts in the area of Fire Safety.

The inquest resulted in 34 recommendations from the Jury. The Committee has reviewed these recommendations and agrees with the majority of them. Many of the recommendations have already been adopted in codes and regulations. Recommendations A-1 and C-1(A) are being addressed by a provincial and national task group respectively. The committee disagrees with blanket approval of recommendations A-5 and C-9 and is of the opinion that recommendations C-2 and C-4 require further evaluation from a cost-benefit perspective relative to past experience.

FORMAT OF THE REPORT

Each of the Jury's recommendations is reviewed separately. Depending on the nature of the recommendations and the Committee's reaction thereto there may be a simple Response, or a Discussion followed by a Recommendation. In order to distinguish the Jury's recommendations from those of the Committee the former are typed in capitals.

For ease of reference the collective Jury Recommendations are attached as Appendix I.

COMMENTS ON RECOMMENDATIONS BY THE CORONER'S JURY

Recommendation (A) Building - Physical Environment

A-1 ALL BUILDINGS WHICH DID NOT COMPLY WITH THE EXISTING BUILDING CODE REQUIREMENTS AT THE TIME OF CONSTRUCTION BE COMPELLED TO MEET THE ORIGINAL STANDARDS PREVIOUSLY SET.

Discussion

This task would be very difficult to accomplish; who will determine these deficiencies, and who will implement the program to inspect each facility and find whether the building complied with the code of the day? In addition, retroactive implementation of an older code may not necessarily solve the problem since the code may be too much out-of-date relative to current minimum standards.

The fact that a building is existing and occupied does not mean that it (or its designers and builders) is immune from compliance with any building laws applicable at the time of construction. It would, however, be difficult and time consuming to try to verify this in the case of all buildings. Building Codes are complex and, up to 1975 when the uniform Ontario Building Code became law, varied from one municipality to another. In addition physical alterations change a building over the years, and its use and occupancy can evolve over time.

Recommendation

We suggest that upgrading of institutional facilities be included in the study of implementing a retrofit section of the Ontario Fire Code. This study is now underway and is expected to be completed by December, 1982. We recommend that, depending on the outcome of the

.../2

Recommendation (continued)

study, each Ministry look at its own legislation and take appropriate action. (Current practices include efforts to implement phased selective upgrading of existing facilities and also when substantial renovations are made a certain amount of upgrading is carried out.)

A-2 LIMIT THE USE OF TOXIC GAS AND HEAT PRODUCING INSULATION.

Response

The use of toxic gas and heat producing insulation is limited under the 1975 Ontario Building Code. Its use is permitted where the insulation is suitably protected (encased).

A-3 BUILDING CODE BE AMENDED TO SPECIFY MECHANICAL FASTENING OF INSULATION TO EXTERIOR WALLS.

Response

The 1975 Building Code requires mechanical fastening to the supporting structure of the finish material necessary to cover combustible insulation. This is more appropriate than requiring such fastening for the insulation because it is the finish material that protects the combustible insulation from immediate involvement in a fire in a room.

Mechanical Fastening is specified for gypsum board protection of insulating material, and the term mechanical fastening means acceptable trade practice as recommended by the manufacturers.

A-4 THAT THERE BE COMPLETE FIRE AND SMOKE SEPARATION OF THE WALLS BETWEEN ADJOINING ROOMS.

Response

This is required in the Ontario Building Code. It is most easily checked during construction, but subsequent fire prevention

.../3

Response (continued)

inspections can usually bring defects to light. In the jury's recommendations the word complete is taken to mean completed, that is, no unprotected openings or unfinished sections.

A-5 HIGH LIFE RISK BUILDINGS TO HAVE DRIVEWAY COMPLETELY AROUND THE BUILDING FOR ACCESS TO ALL EXITS AVAILABLE FOR EVACUATION AND EASIER FLOW OF TRAFFIC.

Response

This may be a desirable aim, but in many instances it would be impractical to enforce. The proposed Ontario Fire Code has provisions for fire chiefs to ask for adequate fire department access.

The jury's recommendation is in excess of the current Building Code requirements which, in the committee's opinion, are acceptable.

Recommendation (B) Furnishings

B-1 SET OF STANDARDS FOR FIRE RETARDANCY BE ESTABLISHED WITH THE ASSISTANCE OF VARIOUS ORGANIZATIONS SUCH AS THE C.S.A., ULC AND THE ONTARIO RESEARCH FOUNDATION.

Discussion

Nursing Home regulations require drapes, curtains, mattresses, mattress covers, decorations, combustible wall and ceiling finishes be flame retardant.

Hospitals are encouraged to purchase fire retardant materials, draperies, curtains, and furnishings including mattress covering and construction.

Furnishings are not regulated by the Ontario Building Code, however:

Discussion (continued)

- The Hazardous Products Branch of the Federal Department of Consumer and Corporate Affairs is at present conducting a study on this subject.

- Development of Flammability Specifications for Mattresses was carried out by the Ontario Research Foundation during 1976 for the Ontario Ministry of Correctional Services. This resulted in the development of Ontario Government Specification 7210-9 (1978) for Flame Retardant Mattresses.

- For pillows there is Ontario Government Specification 7210-21 (1980)

- Canadian Standard CNA2-4.162-M80 covers Flammability Performance Requirements for Hospital Textiles.

- The Hazardous Products Act has enforced minimum requirements with respect to mattresses - "Smoldering Sources of Ignition Tests" and the act was enforced as of January 1, 1982. The Act will regulate all importing, and advertising of mattresses sold throughout Canada.

Recommendation

The committee recommends that the furnishings and textiles be referred to the Retrofit Committee of Ontario under the Ontario Fire Code for review.

B-2 DEVIATIONS FROM THE ISSUED MATERIALS FROM THE HOME SHOULD MEET THESE STANDARDS AND THE ADMINISTRATOR SHOULD BE RESPONSIBLE FOR THEIR COMPLIANCE.

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Response

The committee agrees that the administrator should be responsible for control of furnishings and furniture. For discussion refer to B-1.

Recommendation (C) Fire Protection

C-1 ALL HEALTH CARE FACILITIES ROOMS TO BE EQUIPPED WITH A HEAT DETECTOR CONNECTED TO
A) AUTOMATIC DOOR CLOSERS
B) FIRE ALARM SYSTEM WITHIN THE FACILITY
C) A DIRECT LINK WITH THE FIRE DEPARTMENT

Discussion

Heat detector should be interpreted as any detection device. The connection is not necessarily to the door but indirectly through the fire alarm control panel.

From a fire safety point of view it is the committee's opinion that automatic door closers are desirable. In fact, automatic closers are required under the current building code. However, self closers on individual bedroom doors could present operational difficulties and increases in maintenance cost. If a fully automatic door closing system is to be mandatory for every bedroom in existing facilities the cost per door would be in the order of $500 ($25 million province-wide). Due to the fact that the application of door closers on bedroom doors in health care facilities is impractical, a closer must be equipped with an electrical hold open device connected to the fire alarm system. This would add to the cost of this feature to the extent of millions of dollars. In many cases where detectors are connected to the fire alarm system, major upgrading of the existing fire alarm system may be required.

Recommendation

Studies on the effectiveness and practicability of self-closers in

.../6

Studies on the effectiveness and practicability of self-closers in

Recommendation (continued)

institutional facilities are being conducted at the national level by the Task Group on Health Care Facilities of the Standing Committee on Use and Occupancy under the National Building Code of Canada. Code requirements may change in the next few years, therefore it seems prudent to wait and see what will evolve before modifying requirements for existing buildings.

C-1 (B) and (C)

Response

As already indicated, nursing homes, public hospitals, psychiatric hospitals, and certain types of homes for the aged are required to have heat or smoke detection devices connected to the fire alarm system in the facility. Therefore this recommendation has no impact on health care facilities.

It is agreed a direct hook-up between health care facilities and the local fire department will ensure immediate notification to the fire department. The Ontario Building Code requires that this be in place - where it is available.

Health care facilities must be equipped with heat or smoke detectors, or be protected by a sprinkler system. The activation of any of these devices must, in turn, activate the fire alarm system. Activation of the fire alarm system must cause all hold-open devices on doors in fire separations to release, and must be transmitted automatically to the fire department. Recommended revisions to the Ontario Building Code, anticipated to come into effect in 1982, include the requirement

Response (continued)

that smoke detectors connected to the fire alarm system be installed in every patient's room.

C-2 HEAT SENSOR TO ACTIVATE WARNING LIGHT ABOVE DOOR OUTSIDE RESIDENT'S ROOM, NURSING STATION AND MAIN ANNUNCIATOR PANEL.

Response

The Building Code specifies that activation of fire detection devices must show at the main annunciator and must immediately warn persons on duty by an audible signal. Warning lights at the door to the room, where activation was initiated, could facilitate locating the fire but whether or not their installation is justified when a fire alarm system is appropriately zoned, and staff are trained accordingly, is debatable.

C-3 SMOKE DETECTOR IN EACH ROOM WITHIN FACILITY AS AN ADDED SAFETY FEATURE.

Response

In an existing facility the presence of a heat detector or a smoke detector should be deemed reasonable.

C-4 IN CONJUNCTION WITH THE AUTOMATED DOOR SYSTEM, SPRINKLER SYSTEM TO BE INSTALLED.

Discussion

Sprinkler systems are unquestionably an effective safety measure and would probably reduce the chance of multiple deaths in Ontario's health institutions.

.../8

Discussion (continued)

The committee agrees with the retroactive installation of sprinkler systems in hospitals on a selective basis - taking into account building height, type of construction, means of egress, etc. - particularly when occupied by chronic patients.

The committee does not believe that sprinkler systems should be regulated for all health care facilities without first establishing the need for such protection.

Recommendation

The committee is of the opinion that the Ministry of Health and the Ministry of Community and Social Services in conjunction with the Fire Marshal's Office should undertake a feasibility study which considers costs and benefits.

C-5 AS INDICATED IN SECTION 38 SUBSECTION #2 OF THE NURSING HOMES ACT 1972, TRANSOM TO BE REFERRED TO AS TRANSOM AND/OR TRANSOM PANEL.

Response

Separate consideration of transoms or transom panels is not relevant. In general, all openings in a fire separation must be protected with a closure having a fire-protection rating appropriate for the fire-resistance rating of the fire separation.

C-6 IN CONJUCTION WITH THE FIRE ALARM BEING ACTIVATED, INTERLOCKS SHOULD BE PROVIDED TO TURN OFF ALL AIR HANDLING AND AIR CONDITIONING SYSTEMS, AND ELECTRICALLY OPERATED ISOLATION DAMPERS SHOULD BE PROVIDED IN ANY INTER CONNECTING AIR DUCTS.

Response

Fan shut down and design requirements for fire dampers and their operation are specified in the Ontario Building Code.

We assume that the recommendation related to the electrically operated isolation dampers was intended to mean smoke dampers in various locations. These would be under the requirement of smoke control measures for high-rise buildings and are not required in buildings of the height in which the fire occured, nor are they retrofitted to existing buildings.

C-7 FIRE DOORS TO OPEN IN THE DIRECTION OF EXIT TRAVEL.

Response

Requirements of the Building Code are for fire doors to open in the direction of access to exit travel.

C-8 MORE THOROUGH INSPECTION OF EXISTING FIRE HOSE INSTALLATIONS WITHIN THE FACILITY.

Response

Regulations under the Ontario Fire Code, Section 6.4 Stand-pipe and Hose Systems, require monthly inspection of fire hoses and hose cabinets, and annual inspection of hose valves plus maintenance procedures for valves and hoses.

C-9 THAT SECTIONS A, B AND C BE RETROACTIVE.

Response

Given the complexity of the jury's recommendations, the issue of retrofitting cannot be addressed in isolation. The jury's

.../10

Response (continued)

recommendations on the issue of retrofitting of sections A, B and C based on the experience of one fire are in the opinion of the committee inappropriate. Any comprehensive review should be undertaken on a much broader basis. Some of the practical and financial implications of implementing the recommendations by the jury related to retrofitting are outlined in Appendix II.

Recommendation (D) Training in Health Care Facilities

1. REGULATORY BODY BE SET UP TO ESTABLISH MINIMUM STANDARDS FOR NURSING AIDES.

2. TRAINING IN FIRE SAFETY OF THE STAFF AT HEALTH CARE FACILITIES TO BE THE RESPONSIBILITY OF THE ADMINISTRATION AND TO INCLUDE IN-SERVICE PROGRAMS UNDER THE AUSPICES OF THE FIRE DEPARTMENT - THE ABOVE TO BE MANDATORY ON ALL SHIFTS.

3. EVACUATION PROCEDURES EITHER HORIZONTALLY OR VERTICALLY SHOULD BE DEVELOPED AND PRACTISED SEMI-ANNUALLY IN CO-OPERATION WITH FIRE, POLICE, AMBULANCE AND HEALTH CARE FACILITY.

4. STAFF OF HEALTH CARE FACILITIES TO BE ACQUAINTED WITH AND INSTRUCTED IN THE USE OF FIRE BLANKETS AND FIRE HOSES.

5. SIMPLIFIED FIRE AND DISASTER MANUALS TO BE COMPILED AND TO INCLUDE EASILY IDENTIFIABLE GRAPHIC SYMBOLS.

Response

To many health care facilities training in fire safety from fire departments is not available. For this situation there are the following alternatives to be considered:

- A company or consulting firm providing fire safety services
- Individual ministries might provide the manpower for this service

.../11

Response (continued)

. Additional funding might be provided to municipalities for this service

. The institutions to hire staff for this service

. Purchase of services from a central ministry (Solicitor General)

For Recommendation D-3 the Committee suggests that semi-annually be changed to annually for this major undertaking.

Recommendation (E) Pre-planning and Tactical Surveys

1. PRE-PLANNING AND TACTICAL SURVEYS OF NURSING HOMES, HEALTH CARE FACILITIES AND HIGH LIFE RISK PLACES.

2. A CONDENSED VERSION OF EXISTING TACTICAL SURVEYS WITH USE OF GRAPHIC SYMBOLS AND THE INCLUSION OF PHOTOGRAPHS OF THE ACTUAL BUILDING TO FACILITATE EASIER IDENTIFICATION.

3. STANDARDIZATION OF PRE-PLANNING WITHIN THE FIRE DEPARTMENT.

Response

Pre-planning and tactical surveys are arrangements which should be between the health care facility and the municipal fire department.

The government teaches the importance of comprehensive pre-planning at the Ontario Fire College and at Regional Training Schools. A number of fire departments include building plans and photographs in their pre-planning references.

Recommendation (F) Communication

1. A UNIFORM POLICY TO BE DEVELOPED AND FOLLOWED WITH RESPECT TO ESTABLISHING A VISUAL CENTRAL COMMAND POST AT ANY DISASTER, THUS ENABLING BETTER COMMUNICATION BETWEEN AND WITH THE VARIOUS SERVICES.

Response

This is a matter of arrangement and collaboration between the

.../12

Response (continued)

health care facility and the municipal fire department. Its implementation is recommended by the committee.

F-2 RADIO COMMUNICATIONS USED BY THE FIRE DEPARTMENT, SHOULD OPERATE ON AN INCREASED NUMBER OF FREQUENCIES.

Response

The committee endorses this recommendation and has been informed that the Mississauga Fire Department has implemented it.

F-3 THE FIRE DEPARTMENT DISPATCHER SHOULD BE PROVIDED WITH SUITABLE BACK-UP PERSONNEL.

Response

The committee agrees with this recommendation.

Recommendation (G) Fire Department

G-1 ONLY PRESSURE DEMAND TYPE BREATHING APPARATUS BE USED IN THE FIRE SERVICES.

Response

This is a policy matter to be determined by the municipal fire department and the office of the Fire Marshal.

G-2 MUNICIPAL FIRE PROTECTION SURVEY BE CONDUCTED IN MISSISSAUGA BY THE ONTARIO FIRE MARSHAL'S OFFICE.

Response

The Fire Marshal's Office will be prepared to do this if asked by the Municipality.

Recommendation (H) Accreditation

NURSING HOMES SHOULD BE ENCOURAGED TO ACQUIRE ACCREDITATION AND REACH AND MAINTAIN MINIMUM STANDARDS.

Response

At present it is provincial policy to encourage all health care facilities to obtain accreditation status from the Canadian Council on Hospital Accreditation. It should be recognized that the Council does not have the technical staff to provide an extensive fire safety evaluation.

Recommendation (I) Miscellaneous

I-1 IMPROVED IDENTIFICATION OF STAFF MEMBERS IN HEALTH CARE FACILITIES.

Recommendation

The committee recognizes that some form of identification should be provided for staff members in charge of the section. The specific form should be at the discretion of the facility operator.

I-2 ENCOURAGE RESIDENTS TO USE AN IDENTIFICATION BRACELET, WHICH IS BOTH PLEASING IN APPEARANCE AND COMFORTABLE TO WEAR.

Recommendation

This policy is in existence in public hospitals and psychiatric hospitals and available in nursing homes. We concur that it should be encouraged, however, it is not compatible with the service provided in homes for the aged because many residents object to wearing identification bracelets.

I-3 INCREASED SUPERVISION OF SMOKERS WITHIN THE FACILITY.

Recommendation

The committee agrees, however it is a matter of policy and procedural development within the particular type of health care facility.

.../14

I-4 INCREASED PARTICIPATION AND GROUP DISCUSSIONS WITH THE RESIDENTS REGARDING FIRE SAFETY.

Response

The committee agrees with the recommendations and refers to its response to Recommendation (D).

APPENDIX I

SUMMARY OF JURY'S RECOMMENDATIONS

A) Building - Physical Environment

1) All buildings which did not comply with the existing building code requirements at the time of construction be compelled to meet the original standards previously set.

2) limit the use of toxic gas and heat producing insulation

3) Building code be ammended to specify mechanical fastening of insulation to exterior walls

4) that there be complete fire and smoke separation of the walls between adjoining rooms

5) high life risk buildings to have driveway completely around building for access to all exits available for evacuation and easier flow of traffic.

B) Furnishings

1) Set of standards for fire retardancy be established with the assistance of various organizations such as the C.S.A., ULC and the Ontario Research Foundation.

2) Deviations from the issued materials from the home should meet these standards and the administrator should be responsible for their compliance.

C) Fire Protection

1) All health care facilities rooms to be equipped with a heat detector connected to

   A) automatic door closers

   B) fire alarm system within the facility

   C) a direct link with the fire department

C) Fire Protection (continued)

2) Heat sensor to activate warning light above door outside resident's room, nursing station and main annunciator panel.

3) Smoke detector in each room within facility as an added safety feature.

4) In conjunction with the automated door system, sprinkler system to be installed.

5) As indicated in section 38 subsection #2 of the Nursing Homes Act 1972, transom to be referred to as transom and/or transom panel.

6) in conjunction with the fire alarm being activated, interlocks should be provided to turn off all air handling and air conditioning systems, and electrically operated isolation dampers should be provided in any inter connecting air ducts.

7) fire doors to open in the direction of travel

8) more thorough inspection of existing fire hose installations within the facility

9) That sections A, B & C be retroactive.

D) Training in Health Care Facilities

1) Regulatory body be set up to establish minimum standards for nursing aides

2) Training in fire safety of the staff at health care facilities to be the responsibility of the administration and to include in service programs under the auspices of the fire department - the above to be mandatory on all shifts.

3) Evacuation procedures either horizontally or vertically

D) Training in Health Care Facilities (continued)

3) should be developed and practised semi-annually in co-operation with fire, police, ambulance and health care facility

4) Staff of health care facilities to be acquainted with and instructed in the use of fire blankets and fire hoses

5) simplified fire and disaster manuals to be compiled and to include easily identifiable graphic symbols

E) Pre-Planning and Tactical Surveys

1) Pre-planning and tactical surveys of nursing homes, health care facilities and high life risk places

2) A condensed version of existing tactical surveys with use of graphic symbols and the inclusion of photographs of the actual building to facilitate easier identification

3) Standardization of pre-planning within the fire department

F) Communication

1) a uniform policy to be developed and followed with respect to establishing a visual central command post at any disaster, thus enabling better communication between and with the various services

2) radio communications used by the fire department, should operate on an increased number of frequencies.

3) the fire department dispatcher should be provided with suitable back-up personnel.

G) Fire Department

1) Only pressure demand type breathing apparatus be used in the fire services

G) Fire Department (continued)

2) Municipal Fire Protection survey be conducted in Mississauga by the Ontario Fire Marshal's Office.

H) Accreditation

1) Nursing homes should be encouraged to acquire accreditation and reach and maintain minimum standards.

I) Miscellaneous

1) improved identification of staff members in health care facilities

2) encourage residents to use an identification bracelet, which is both pleasing in appearance and comfortable to wear

3) increased supervision of smokers within the facility

4) increased participation and group discussions with the residents regarding fire safety

APPENDIX II

COST AND OTHER IMPLICATIONS

OF IMPLEMENTATION

OF THE JURY'S RECOMMENDATIONS RELATED TO RETROFITTING

Recommendation (A) 1

As discussed under (A) 1, this is virtually impossible to accomplish and could result in updating from one outdated standard to one that is a little less obsolete. The implementation costs would likely be prohibitive.

An order of magnitude estimate, while difficult, could probably be established by sample evaluation of some 15 - 20 facilities, provided the applicable codes were available.

Recommendation (A) 2

Retroactive implementation of (A) 2 would require, in most instances, an intimate knowledge of the particular construction for any given building, or a "dismantle and verify" mission. Where such materials are found to be exposed the institutions are advised to comply with the current Building Code.

Recommendation (A) 3

Recommendation (A) 3 is not suitable for retroactive implementation.

Recommendation (A) 4

Completion of all fire and smoke separations in existing buildings will also be very difficult and costly in the majority of cases, and impossible in some. Where such deficiencies are found in existing facilities, the owners are advised to take corrective measures.

Recommendation (A) 5

If implemented, where physically possible, completely surrounding driveways (other than adequate access for the fire department) would be very expensive for a seemingly minor improvement.

Recommendation (B) 2

After the (new) (B) 2 standards referred to in (B) 1 in the body of the committee's report are in place, the institutions should be urged to adopt a gradual replacement program where applicable.

Recommendation (C) 1 a)

If this recommendation were implemented retroactively the order of magnitude cost estimate would be 50,000 doors @ $500 = $25 million.

Recommendation (C) 2

If automatic door closers (and electric hold-open devices) are installed retroactively the warning lights over the doors become necessary. Order of magnitude cost estimate:

50,000 doors X $200 = $10 million

Recommendation (C) 3

Retrofitting of smoke detectors in addition to other, existing, detection devices would again be very costly - say, $10 million.

Recommendation (C) 4

Across the board retrofitting of sprinklers would likely require an expenditure in excess of $100 million (based on an average cost of $2.00 per square foot).